DOCUMENT RESUME

ED 075 048 LI 004 204

AUTHOR Howe, Robert L.
TITLE CEIS Overview.
INSTITUTION California State Dept. of Education, Sacramento.
PUB DATE 72
NOTE 41p.; (0 References)

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Academic Records; Attendance Records; Automation; *Computer Programs; Education; Educational Finance; *Electronic Data Processing; Information Processing; *Information Systems; Scheduling; School Accounting; Student Records
IDENTIFIERS California; *California Education Information System; CEIS

ABSTRACT

The California Education Information System (CEIS) was developed to provide integrated information processing for educators at every level of operation. The objectives of CEIS are to make available through a state-wide system for local district use, complete, current and reliable information about education at the local and state level. CEIS provides a flexible and comprehensive means of obtaining better information for the management of educational programs. At the same time, CEIS automates most of the routine information processing. This document presents an overview of the important features of the two new subsystems that constitute CEIS. The business subsystem currently includes five applications: Control, Accounts Payable, Stores Inventory, Personnel/Payroll, and Financial. The pupil subsystem is divided into nine applications: Process Control, Master File Maintenance, Attendance Accounting, Mark Reporting, Test Reporting, California Guidance, Educational Planning, Student Scheduling and Master Schedule Builder. (A preliminary report on CEIS is ED 056 520.) (Author/SJ)

ED 075048

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California Education Information System

ceis overview

CALIFORNIA STATE DEPARTMENT OF EDUCATION • Wilson Riles, Superintendent of Public Instruction • Sacramento, 1972

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This publication was prepared under the direction of Robert L. Howe, Chief, State Processing Information System, California State Department of Education, and was published by the Department, 721 Capitol Mall, Sacramento, California 95814.

CEIS OVERVIEW

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CALIFORNIA EDUCATION INFORMATION SYSTEM

SYSTEM OVERVIEW

INTRODUCTION

The California Education Information System (CEIS) is now available for review and evaluation by educators. CEIS was developed to provide integrated information processing for educators at every level of operation, from the classroom teacher to district, county, region and state offices. The objectives of CEIS, as established by the State Legislature, are to make available through a statewide system for local district use, complete, current and reliable information about education at the local and state level. A major step toward these objectives has now been attained through the newly available CEIS.

CEIS provides a flexible and comprehensive means of obtaining better information for the management of educational programs. At the same time, CEIS automates most of the routine information processing which would otherwise require many hours of clerical time. This document presents an overview of the important features of the two new subsystems that constitute CEIS.

The Business Subsystem, now available for the first time, currently includes five applications: Control, Accounts Payable, Stores Inventory, Personnel/Payroll, and Financial. Each of these applications was developed by the State Department of Education staff working closely with the various associations, committees, school districts, and individuals concerned with CEIS.

The new Pupil Subsystem is an outgrowth of what has been known as the CEIS Pupil System. The new Pupil Subsystem not only encompasses all the functions of the earlier system with much greater power and capabilities, but it also includes added functions not previously available. The Pupil Subsystem is divided into nine applications: Process Control, Master File Maintenance, Attendance Accounting, Mark Reporting, Test Reporting, California Guidance, Educational Planning, Student Scheduling and Master Schedule Builder.

BACKGROUND

In 1959 the Department of Education of the State of California began studies to determine how the then emerging techniques of electronic data processing might be used to advantage in the various fields of public education. Initial emphasis was placed on relieving the counselor of tedious clerical tasks and on furnishing him and the teacher with information necessary to obtain successful student growth and progress. The original CEIS Pupil System was developed as a result of the initial studies. Although it has fewer capabilities and less flexibility than the new CEIS Pupil Subsystem, the original CEIS Pupil System has served approximately forty percent of the school districts in California as well as districts in six other states and one other country. The concepts of the original CEIS have been well accepted.

Many factors have led the Bureau of Information Systems of the California State Department of Education to design a totally new CEIS. The most important of these factors are: the original CEIS needs to be expanded in scope; educational program accountability can be accommodated more effectively by a redesign of the original CEIS; and, techniques of using electronic computers have been greatly improved as

that flexibility and efficiency can now be combined within a single system.

Before the new system design was finalized, educators throughout the state were consulted for ideas and requirements. Wherever possible, proven concepts of systems currently in operation were utilized to ensure practicality of design. Data processing specialists were consulted for the latest technology.

Now, after the new CEIS has been designed, programmed and tested under varying conditions, individual schools, school districts and all who have need of better information for the management of education programs have available for their review and evaluation a data processing system that is comprehensive, efficient and flexible.

CEIS DESIGN

Conceptually, CEIS is a package of interrelated subsystems and computer programs to serve the needs for pupil services, personnel services, business services, and instructional programs. Each of the two new subsystems is divided into distinct applications. Most of the applications in each subsystem are designed to function on a stand-alone basis, but the most effective results are obtained when all the applications are used together as an integrated system. Great efficiency is obtained when the different applications exchange and combine information at electronic speed.

Before the new CEIS was designed, much serious thought was given to choosing design goals that would result in a system that is efficient, economical, and most of all, useful. The goals discussed briefly below are independent of the types of data to be processed. When taken together, the goals have enabled the building of an integrated information processing system that not only meets the needs of education today, but can be readily adapted to meet the needs of the future.

Flexibility Foremost of the design goals is flexibility. Not only are the needs for information processing different between any two school districts, the needs also vary between schools in the same district. Therefore, CEIS is divided into applications, each of which may be utilized or not as is chosen by a school or a district. (The control applications are an exception as will be explained later.) Only those applications selected by a school or district are processed. No added time or expense is incurred for processing that is not desired.

Each application is designed to offer a wide variety of reports. A school or district may choose those reports it desires without paying a penalty for omitting the others that are available. Many of the reports are available in two or more different sequences of information presentation. If required, certain reports may be produced more than once, each time in a different sequence as specified by a school or district.

Users of the new CEIS are not locked-in to the selections of reports and report sequences made at the beginning of a school year. Any application, report or report sequence may be dropped at any time during a school year. Likewise, as long as the data required to produce new reports are available to the system, new reports and new report sequences may be requested at any time.

Alternative techniques to meet the needs of different schools and districts are

available in the processing of data within each application. For instance, the Stores Inventory Application contains the following options for processing Out of Stock items: issue available amount from stock; reject because of insufficient stock; or, issue requested amount from stock (borrowing as necessary). The Attendance Accounting Application will produce Irregular Attendance Reports or Excessive Absence Warnings (both optional reports) based upon school specified number of absences rather than upon any fixed set of application values. The number of processing options and parameters is too great to enumerate in this document.

In the Financial Application, budgets and actuals may be identified by any one of five different account structures. These range from great detail for a cost-accounting approach, as may be required by a larger district, to a summarized level for meeting a smaller district's requirements as well as state and federal requirements.

The various options for reports, report sequences, processing methods and processing parameters enable individual schools and districts to tailor each application to suit its needs. Wide variations in application usage are possible without deviating from the standard system.

Integration Although CEIS is made up of two subsystems, each further divided into separate applications, all parts of CEIS are designed to constitute a total, integrated system. Data that are used by more than one application need be furnished only once to the data center. Each application passes any necessary data it received to all other applications having need for the data.

The Student Master File in the Pupil Subsystem is utilized directly or indirectly by all applications in the subsystem. Each application has the latest data available about any student at all times.

A Business System Master File, a Calendar Master File and a Financial Activity Table is utilized by each application in the Business Subsystem. Coordination of all financial activities is maintained between the various applications in the subsystem.

While the total system design includes the capability for each application (excluding control applications) to operate on a stand-alone basis, the basic strength of the system is in the interrelationship of one application to the other, thereby complementing the overall process.

Growth Capability While CEIS is now intended to meet the current operational requirements of a school district with today's financial framework, the design concepts include the ability to process ultimately within a program accounting framework. This becomes feasible once basic definitions of program identities, operation criteria, and evaluation methods have been established and accepted by a school district.

It seems reasonable to assume, with the capture of commonly identified financial, personnel, and pupil data, that methods of achievement evaluation are limited only by the imagination of the educators and administrators. With the new CEIS, pupil ability, achievement, ranking, and the like can be related to dollars expended and the educational personnel involved by extracting data from the three basic history files: Financial, Pupil, and Personnel.

Transferability CEIS is written in COBOL (COmmon Business Oriented Language), a language accepted by most modern day computers. The new CEIS has been tested on the computers of two different major manufacturers, Honeywell and IBM. Because of the transferability of CEIS, computers produced by other manufacturers can be instructed to use CEIS at a fraction of its original cost. Starting the development of CEIS-like capabilities from the beginning would require great cost and elapsed time. It must be noted, however, that minimal cost computers do not have the capacity to accommodate either COBOL as a language, or data files of a size sufficient to support any system as powerful as CEIS.

Efficiency In the early days of data processing, flexibility and efficiency were not possible in a single system. Modern data processing techniques now permit both characteristics to exist in a system. The design techniques discussed below enable CEIS to operate efficiently for each school and district served no matter what applications or options are chosen.

Design Techniques

Much care has been taken in the design of both CEIS programs and CEIS file structures. The goals of flexibility and efficiency became a reality by splitting all the computer functions of an application into an appropriate number of computer programs. Only those programs that match a school's choice of options need be processed by the computer. Likewise, a new file structure is utilized to avoid setting aside computer space for data that will never be entered into the system.

Control Applications Each subsystem possesses a control application that guides the computer center in processing only those programs that are necessary for each school or district. A control file is established at the start of each school year for each school and each district using a subsystem. The file retains a record of the various applications that are to be processed. Also contained in a control file are the options chosen for each application. The control application is therefore necessary for utilization of any other application within a subsystem. One might say, therefore, that no processing application is truly stand-alone because of the need to use the appropriate control application.

The number of options and parameters that may be specified for an application are listed on one form for each application so that a school or district may choose only those options that it wishes. The forms are sent to the data center before the start of a processing year and the control file(s) for each school and district are established.

The Control Application of the Business Subsystem is processed each day prior to processing any regular district activity data. A Process Control Record is produced for the day to identify which districts and applications are to be processed, how the district activity is controlled, and what reports are to be produced.

The Process Control Application of the Pupil Subsystem is processed only when a school or district either wishes to change any of its options or parameters or wishes to obtain a computer produced listing of its options and parameters. The control file established by the application guides the processing of the Pupil Subsystem without the necessity of running the Process Control Application each day.

Modular Files The Student Master File in the Pupil Subsystem contains a series of modules of information about each student. Only those modules necessary to the Processing of the applications chosen by a school are created for a student. If a

school or district chooses not to use an application, the size of the Student Master File is reduced by eliminating the modules used only by that application. One required and 13 optional modules are used at the present time to store all current data for a student. Each program is designed to use only those modules that are necessary for its operation. The presence or absence of modules not used by a program do not affect program operation. The modular design of the Student Master File promotes operation efficiency and reduces storage requirements to a minimum, thus saving school dollars.

Additional modules may be defined in the future to meet new requirements placed upon CEIS. New programs will be necessary to process any new requirements, but existing programs need not be affected.

AVAILABILITY OF CEIS

The CEIS programs and documentation have been developed, tested, and are maintained by the Bureau of Information Systems of the California State Department of Education, 721 Capitol Mall, Sacramento, California 95814. Inquiries concerning the availability of programs and documentation are welcomed and should be directed to the Bureau.

CEIS BUSINESS SUBSYSTEM

INTRODUCTION

The CEIS Business Subsystem has been developed to furnish school districts with a comprehensive means of processing financial and personnel information using modern electronic computers. The subsystem consists of four processing applications and a Control Application. The four processing applications and their general functions are:

- Accounts Payable Application - processes commerical account types of transactions from the origination of requisitions through purchase orders to generation of warrants for payment.
- Stores Inventory Application - uses purchase and inventory change data to maintain inventory status.
- Personnel/Payroll Application - produces payroll warrants and maintains all payroll records. It maintains personnel data relative to work history, credential and educational background, sick leave and vacation leave balances, and retirement information.
- Financial Application - processes transactions generated from the Accounts Payable, Stores Inventory and Personnel/Payroll applications, provides direct input to Financial Application such as budgeted amounts and accounts and adjustments and produces required fiscal financial management reports.

Each of the processing applications, in combination with the required Control Application, can function as a stand-alone system. A district may use any one, combination, or all of the processing applications of the CEIS Business Subsystem. However, each of these applications has been designed to furnish automatically any data that can be utilized by another of the applications. Likewise, each application accepts any required data from the other applications and thus negates the need to prepare repetitive data entry documents. Although less than the total subsystem may be utilized by a district, the most effective results are obtained when all the applications in the subsystem are used together as an integrated system.

CONTROL APPLICATION

The Control Application literally provides the control of all Business Subsystem processing for each district. The information required and retained by the application includes such data as district and school identification, accounting descriptions, and the basic business calendar for application within each district using the subsystem. Likewise, the various processing and report options selected by each district are accepted and retained for daily processing control.

This application provides schedules for the data center to use in planning and performing work for each district. The districts provide the basic scheduling information at the start of each fiscal year. Other scheduling information is supplied by the districts periodically. From this information the application causes the printing of schedules and provides controls to insure that computer processing is performed on the dates desired by each district.

The use of the Control Application is necessary no matter which of the other applications in the Business Subsystem are utilized.

Data Processed

The data required and accepted by the Control Application is recorded on specially designed forms. Many of the forms must be completed and forwarded to the data center to establish two control files before any other application in the subsystem can be activated.

Business System Master File The Business System Master File is one of three required files that permit any use of the Business Subsystem. This file contains eight subfiles of information for each district. The district subfile contains the following types of information: district name and code, district options common to all applications, application options for each specific application the district has selected, cutoff dates indicating the last date in which transactions may be processed for a specified accounting period, and the district name and address. Another subfile contains account conversion codes, the codes necessary to convert any Expanded State Class (function and object code) combinations to the equivalent State Class Account Codes. The remaining six subfiles contain descriptive information for the following different codes used within the subsystem: county, school, fund, function, object, and State Class Accounts with valid fund codes by State Class.

Calendar Master File The Calendar Master File is the second required file for any use of the Business Subsystem. The file contains the specifications of which reports are to be produced on each date, dates to be used on forms such as payroll warrants, indications as to which processing is done monthly, quarterly, or yearly, and the specifications of which "logic decisions" are to be made by the computer on given dates. The file also contains other varied information necessary to an application that is not included in other control fields.

The Calendar Master file is a dynamic file that will be updated by each district throughout the course of the fiscal year. The basic file must be created, however, before any other application can be initialized. All additions and changes to the Calendar Master File are carefully checked for the proper fiscal year before they are accepted. Separate Business System Master Files and Calendar Master Files enable a data center to process data for two different fiscal years concurrently.

Financial Activity Table Although not part of the Control Application, the third file that is required by any use of the Business Subsystem is the Financial Activity Table. This file is created by a one time use of part of the Financial Application. It is described under that application.

Processing

The Control Application is processed each business day. Any changes or additions to the Business System Master File and the Calendar Master File are processed first. Then the application uses data from these files to produce the Process Control Records (PCR) for each application and district for which a PCR select card is entered. There is a record for each district and application to be processed that day, which indicates how each district's activity is to be controlled, and what reports are to be produced by each application.

Reports

Eight different reports, one for each subfile, may be printed upon request from the

data held in the Business System Master File. These reports enable a district to verify that the data it has submitted have been entered correctly. They also provide a source of reference for all information currently in the file.

Reports from the Calendar Master File show the dates, reports, logic options, processing cycles, and miscellaneous data held in the file. The Calendar Master Report shows the computer activity scheduled for a seven day period, while the Detailed Period Report covers whatever period of time is specified, by application, in the report request document.

Process Control Reports are produced to list for each application of each district all of the Calendar Master File and Business System Master File information that is used to control the days computer processing for the application.

Reject reports are prepared if any data submitted to the Control Application appears to be in error.

Interface With Other Applications

The Process Control Record produced by the Control Application provides the direction for processing to all other applications in the Business Subsystem. The Control Application therefore interfaces directly with all applications in the subsystem.

ACCOUNTS PAYABLE APPLICATION

The Accounts Payable Application is a comprehensive system of computer programs that audits input data for validity and appropriate budget status; records encumbrance, receipt, and payment information; calculates applicable taxes and discounts; controls the setting of commercial warrants to vendors and, under certain specific conditions, to employees to show payment is due for other than wages or salaries. The application also creates the financial entries for the booking of purchases, payments, credits, adjustments and similar activity normally included in an automated accounts payable system.

While the application can be used as a stand-alone system, it is designed to be used as an integral part of the IBIS Business Subsystem, an integrated set of computer programs that provide a complete record of all financial action generated by a county or a district.

The Accounts Payable Application allows complete flexibility within the limits established by the State of California. A variety of options, schedules, and controls are provided which allow the user to tailor this application to easily fit specific requirements within the scope of the overall specifications.

Data Processed

Before any accounts payable data may be processed, the Control Application must be used to establish the Business System Master File and the Calendar Master File. If the Financial Application is not used, alternative procedures must be followed to establish the Financial Activity Table. Descriptions of these files are contained in the discussion of their respective applications.

Vendor Master File Each data center maintains a consolidated Vendor Master File that is used by all districts served by the data center. The Vendor Master File contains vendor numbers and their associated vendor names and optional vendor addresses. Each district submits its data for inclusion in the file. Changes and additions may be made at any time. The file is purged automatically through use of a district specified retention time for no activity, but immediate deletion may be ordered.

Vendor numbers are assigned in one of three blocks according to the application using the number. The number blocks and using applications are:

- Voluntary Deduction Codes - Personnel/Payroll
- Vendor Numbers - Accounts Payable and Stores Inventory
- Social Security Numbers - Accounts Payable

Permanent Application Files Three different permanent files are maintained by the Accounts Payable Application: the Purchases and Payments File, the Credit Balance Vendors File, and the Warrant History File. All applicable data from previous accounts payable processing must be forwarded to the data center to establish these files. Data center liaison personnel will assist in developing the most efficient conversion methods to establish these files initially.

Data from the following types of transactions are used to maintain these files:

- New Purchase Orders
- Changes to Purchase Orders
- Deletion of Purchase Orders
- Request for P.O. Partial Payment
- Request for P.O. Final Payment - Order Completed
- Request for P.O. Final Payment - Order Not Completed
- Blanket Purchase Order Payments
- Changes to Request for P.O. Payment
- Request for Non-PO Payment
- Changes to Request for Non-PO Payment
- Manual (handwritten) Warrants
- Changes to Manual Warrants
- Warrant Cancellation
- Credit Memos
- Changes to Credit Memos
- Merchandise Receipt
- Changes to Merchandise Receipt

Processing

Details of all of the processing that takes place within the Accounts Payable Application are beyond the scope of this document. However, the processing performed upon the receipt of a new purchase order or a change to an existing purchase order is described in this section, and is representative of the types of processing within the application.

When processed, new purchase orders and purchase order change information will:

- Result in purchase order information being printed on the Purchase and Payment Report.

- Normally add to "Encumbrances" and subtract from "Available Budget" figures in the Financial Audit File, if the file is used.

- Setup or modify records in the Purchase Order Payment File.
- Forward re-order information to the Stores Inventory Application, if it is used.
- Forward encumbrance information to the Financial Application, if it is used.

Reports

Three categories of reports are produced by the Accounts Payable Application. Automatic reports are produced each time the application is processed. Requested reports are produced according to the date that is contained in the Calendar Master File. Vendor Reports are produced as appropriate as determined by the data center.

Automatic Reports Batch Control Lists are produced for each group of like transactions submitted to the data center. Error Control Lists are produced if any item in a batch is rejected or is an exception item. The Purchase Order File Status Report lists each purchase order line item in the Purchase and Payment File after the current update processing for each district is completed. The Cancelled Warrant Detail Report includes all detail used to create a warrant if the warrant is now cancelled. The Credit Balance Report is automatic if activity occurred, and optional if no current activity occurred. If interfaced with Stores Inventory application, the A/P - Stores Reference Report lists all activity that was sent to Stores Inventory by Accounts Payable.

Requested Reports Nine different reports are classified as requested reports. These reports are produced when scheduled. The Purchase and Payment Reports show the outstanding authorized balance which can be paid on any specific line item. The "Complete" report shows all activity; current shows this cycle with related transactions.

The Credit Balance Vendor Report indicates those vendors that owe the district more money than the district owes the vendor by fund. There is no "netting" between funds for a vendor. Input may be coded to by-pass this netting out and pass selected activity directly to warrant process.

Warrants and Remittance Advices are printed by fund within district as scheduled. The Remittance Advice is a part of the warrant form and gives the detail used in arriving at the warrant net amount. If a vendor is owed money from more than one fund, one warrant is written for each fund from which money is due.

Transmittal Reports contain the detail shown on Remittance Advices. Also included are details of handwritten warrants and all cancelled warrants created since the last Warrant Write Cycle.

A Reconciliation Report contains the same basic information that is contained on the actual warrants. If requested, warrant reconciliation tapes will be produced for counties or banks to use for computer reconciliation of warrants written, warrants paid, and cash.

The Paid Invoice Register is produced upon request for user-specified from and through dates. The report provides an easy means to audit from invoice number to warrant number.

A Use Tax Register is produced upon request for user-specified from and through dates. The report is produced by invoice number and may be used to report and submit use tax to the state.

1099 Listings and 1099 Forms are produced upon request. The 1099 Listing contains information for a specified quarter during the year while the 1099 Form contains information for the full year.

Exception and error reports are produced as appropriate during processing.

Vendor Reports Two complete Vendor Master File Listings are produced periodically for all districts. These listings are alphabetic by vendor name and numeric by vendor number. An Accumulated Vendor Activity Listing is produced each time the Vendor Master File is updated and contains all changes or additions to the file since the last complete listings were produced. Only the latest Accumulated Vendor Activity Listing need be kept to supplement the last complete listing.

Batch and error reports are produced as appropriate whenever any changes or additions are made to the Vendor Master File.

Interface With Other Applications

The Accounts Payable Application may be used as a stand-alone application, but the Business Subsystem is designed as a system of integrated applications. The Accounts Payable Application does interface with all other applications in the subsystem. A Financial Activity File is created for use with the Financial Application. A Stores Inventory File with purchase orders and receipts is created for use in the Stores Inventory Application. The Vendor Master File is used by the Personnel/Payroll Application.

STORES INVENTORY APPLICATION

The Stores Inventory Application is a comprehensive system of computer programs that maintain perpetual stores inventory records for items purchased and kept in inventory. The application prints a variety of reports for inventory management as well as catalogs of the stores inventory items. Financial entries for the booking of inventory receipts, issues, and returns are also created.

While this application can be used as a stand-alone system, it is designed to be used as an integral part of the CEIS Business Subsystem. A variety of options, schedules and controls are provided which allow each user to tailor this application to satisfy his specific requirements.

Data Processed

Before any stores inventory data may be processed, the Control Application must be used to establish the Business System Master File and the Calendar Master File. If the Financial Application is not used, alternative procedures must be followed to establish the Financial Activity Table. Descriptions of these files are contained in the discussion of their respective applications.

The Inventory Master File is established to contain all inventory data. This file can be established in a variety of ways; data center liaison personnel will assist in developing the most efficient conversion methods to establish the file.

Once established, the Inventory Master File is kept up to date through use of two major types of transactions, file maintenance transactions and file activity transactions. The file maintenance transactions include the addition of new stock items, changes to stock item information, and the deletion of a stock item. The file activity transactions include replenishment and cancel orders, stock receipts, stock issues, and stock returns. Replenishment orders, cancel orders, and stock receipt information will be forwarded by the Accounts Payable Application automatically if that application is also used.

Processing

The processing of the Stores Inventory Application consists of the standard file maintenance type of inventory processing. Options within the application permit the application of a fixed overhead percentage to items issued if so desired. Units of measure may be converted from units ordered to units issued. Sales tax may be computed on all issues if requested. Batch balancing of input is optional; if selected, out of balance batches are either accepted or rejected as specified. A variety of reports are prepared according to the users requests. Freight, Discount and Tax may be accumulated to stock number and prorated by issuances from stock.

Reports

Two categories of reports are produced by the Stores Inventory Application. Automatic reports are produced each time the application is processed. Requested reports are produced according to the data that are contained in the Calendar Master File.

Automatic Reports The Input Format Control List shows control totals for all input and output records. The Edit and Batch Balance Reports list all data received in each batch and shows batch totals. The Update Activity Report lists all file maintenance (additions, changes and deletions) as well as all order, receipt, return and issue activity. This report also shows accepted and rejected information and any applicable warning messages such as stock running low. The Financial Activity Control List shows the date of production and the accumulated dollar balance of all expenditure and general ledger accounts.

All four of the above reports are produced each time the Stores Inventory Application is processed.

Requested Reports Two different reports are classified as requested reports. These reports are produced when scheduled by the user.

The Stock Status Report lists each item in the Inventory Master File and shows item identification, cost, order data, quantity on hand, and value of quantity on hand. Totals are shown for item value. The report is produced in sequence by item within group within fund.

Two different stock catalogue reports are available, one with item cost printed and one without. Each report shows item identification and unit of measure. The reports are produced in sequence by item within group within fund.

The Shortage by Item Report shows, by item, all stores items which have a quantity on hand less than or equal to the order point quantity for that item. Outstanding purchase orders are shown on the list as well as identification and all status information for each item listed. The report is produced in sequence by item within group within fund.

The Shortage by Vendor Report shows, by vendor, all stores items which have a quantity on hand less than or equal to the order point quantity for that item. The data is the same as is on the Shortage by Item Report, but this report is produced in sequence by item within group within fund within vendor.

The History by District Report shows all stores inventory transactions for a district specified period of time. Beginning and ending values for quantity on hand and unit price are shown for each item.

The History by Location Report shows all stores inventory transactions, by location (school), for a district specified period of time. A similar report, the History by Department Report, groups the transactions by department instead of school.

Although named the Quarterly Zero-Balance Report, this report may be requested at any time. The report shows all stores inventory items which have had a zero or negative quantity on hand for ninety days or more from the date of report preparation. The report is printed in sequence by item within group within fund.

The 13-Month No Activity Report shows all stores inventory items which have had no transaction activity during the thirteen months preceding report preparation. The report may be requested at any time and is produced in sequence by item within group within fund.

Upon request, Physical Stores Inventory Cards are punched with full item description including group code, fund code and district code. Also punched in each card is bin code, the physical location of the item in the user's stores. The cards, one per item, can be useful in taking a physical inventory.

Interface With Other Applications

The Stores Inventory Application may be used as a stand-alone application, but the Business Subsystem is designed as a system of integrated applications. The Stores Inventory Application does interface with all other applications in the subsystem except the Personnel/Payroll Application. A Financial Activity File is created for use by the Financial Application. The Inventory Status File is used by the Accounts Payable Application.

If available, the Financial Audit File of the Financial Application and the Stores Inventory File of the Accounts Payable Application are used by the Stores Inventory Application.

PERSONNEL/PAYROLL APPLICATION

The Personnel/Payroll Application is a comprehensive system of computer programs that provides the capability of maintaining and reporting all current and historical personnel data necessary to meet the continuing needs of a district for effective management. The application also provides all of the labor distribution, accounting, service, and legal functions expected of an automated payroll system. The personnel reporting capabilities are separate from the payroll functions of the application, thus allowing a district to utilize either the personnel segment or the payroll segment independently of the other.

While this application can be used as a stand-alone system, it is designed to be used as an integral part of the IBIS business subsystem. A large number of options, subfiles and controls are provided which allow each user to tailor this application to satisfy his specific requirements. Appropriate forms are supplied to enable the user to review all options offered and to express his choices. The application has been designed by educators for educators and encompasses almost all variations of personnel and payroll practices required by any school district.

Data Processed

Before any personnel/payroll data may be processed, the General Application must be used to establish the Business System Master File and the Calendar Master File. The Financial Application must be used to establish the Financial Activity Table and the Accounts Payable Application must be used to establish a Vendor Master File. Descriptions of these files are contained in the discussion of their respective applications. Once these files are established, it is necessary to convert the personnel and payroll data to establish the Employee Master File. This file can be established in a variety of ways, and data center liaison personnel will assist in developing the most efficient conversion methods to establish the file.

Any detail of the types of data processed by this application requires more space than can be taken in this document. Therefore the data entry form is described briefly and the others are listed by title to present a partial picture of the data processed.

The Notice of Employment form is the basic data entry document of the application and serves several purposes. The Clerk form may be used to establish a new employee on the Employee Master File. A computer-printed copy of the document is retained for retention in district files. Once processed, it becomes a "hard-ground document" that may be used to indicate changes, additions, or deletions of data in the data center to update the employee record on the Employee Master File. The form contains such information as employee name and address and payroll data including salary codes, annual salary advance (SSA) amount, deduction codes and amounts, tax data, retirement data and any leave of absence data. Also included on the form are credential data and educational data. Ample space is provided for job assignment data including all necessary accounting data and program codes.

Other data entry forms used with this application are:

- District Fringe Policy
- Manual Warrant
- Automatic Manual Warrant

- Time Sheets (computer produced)
- Adjustments of:
  - Cumulative Earnings
  - Cumulative Deductions
  - Gross Pay
  - Retirement
  - Non-Production Hours
  - Labor Transfers
- Batch Totals

Processing

Normal payroll processing is based on the election options established on the control files, the payroll data on the Employee Master Record as entered through the entry of Employee Form, and adjustment data.

Salaried employees are paid automatically, based on previously established payroll data on the Employee Master File unless additional data is submitted to adjust the normal pay cycle and/or payment amounts.

Hourly employees are not paid automatically. They are paid based on the payroll data on the Employee Master File in conjunction with the user submitted time sheets and adjustment data.

All salaried employees can use the deferred payment method, a method of withholding part of the employee's normal pay so that salary can be paid during the summer months. There are three plans associated with deferred pay:

- 11 months - provides for one payment during summer months.
- 10 months - provides for two payments during summer months.
- 9 months - provides for three payments during summer months.

The deferred payment amount to be deducted each pay cycle is based on the deferred payment plan factor. The factors are:

- 11 months - 9.1%
- 10 months - 10.2%
- 9 months - 11%

Statutory taxes and retirement are deducted during regular pay cycles and are not therefore deducted from warrants produced during the summer months. Voluntary deductions are optionally deducted during the summer months according to an indicator associated with each specific deduction.

It is suggested that this method be used when spreading annual salaries over a period of time rather than the method of spreading annual salaries over a 12 month period. The latter method, if used, will discuss labor distribution calculations.

An Earned Salary Advance (ESA) is a method of paying employees part of their normal wages in advance of the normal pay cycle. If Earned Salary Advances are to be paid, the decision to do so must be made on a division level and must be entered as a division option. No statutory taxes, retirement or voluntary deductions are taken from the ESA amount when a warrant is produced.

The amount of the warrant to be produced (net amount) is determined by deducting specific items. Statutory deductions are calculated based on the gross salary to be

paid and are deducted first in the following order when applicable: Tax Annuity Shelter, Federal Taxes, OASDI, State Taxes, City Taxes, and Retirement. The amount advanced through SSA, if any, is deducted next. Voluntary deductions are then deducted on a priority basis. If when processing an employee's pay, the gross pay amount is not sufficient to cover all deductions, as many deductions as can be taken will be taken, except that the computer will not create a zero dollar warrant.

Reports

The user of the Personnel/Payroll application automatically is furnished with 11 reports. Up to 33 additional reports are optionally available. The number of reports produced by the application precludes the giving of report details here. The report titles alone provide an insight to the total scope of the application.

Automatic Reports The following reports are automatically produced whenever the application is processed:

- Batch Balance List
- Optional Edit/Audit List
- File Maintenance Error List
- Gross Pay Computation Error List
- Net Pay Computation Error List
- Payroll Register Control Totals
- Financial File Update Error List
- Administration Planning Service - Exception Report
- Administration Planning Service - Personnel Information
- Consol Warrant Report
- Daily Financial Reference Report

Requested Reports The following reports are produced when requested by a district:

- Time Sheets
- Deductions by Vendor
- Labor Distribution
- Sick Leave by Employee
- Sick Leave Summary (By School)
- Month-to-Date Deduction Balance
- Savings Bond Report
- Credit Union Report
- Employee's Compensation
- Service and Age Group
- Professional Qualifications (By School)
- Professional Qualifications (By Employee Name)
- Professional Qualifications (By Major Credential)
- Educational Background
- Termination by School
- Termination by District
- Termination Summary
- Turnover Ratio
- Expired Credentials
- Alpha List by School Including Payrate
- Alpha List by School Excluding Payrate
- Alpha List by District Including Payrate
- Alpha List by District Excluding Payrate
- Warrant Register

- Payroll Register Without Labor
- Payroll Register With Labor
- W2 Statements
- Earnings Report
- PERS Report and Tape
- STRS Report and Tape
- Employee Deduction List
- Quarterly Tax Report
- Year-to-date Quarterly Tax Report

Other Computer Results Warrants are not included as either an automatic report or as a requested report. Warrants are produced when the appropriate data are entered into the system.

In addition to the magnetic tapes that are produced for forwarding to the pertinent retirement systems, three additional magnetic tapes may be requested for forwarding to appropriate places. These three tapes are:

- Bank Reconciliation Tape
- W2 Tape
- Quarterly Tax Tape

Interface With Other Applications

The Personnel/Payroll Application may be used as a stand-alone application, but the Business Subsystem is designed as a system of integrated applications. To use any application to its fullest extent, it is suggested that the complete Business Subsystem be utilized. The Personnel/Payroll Application creates a Financial Activity File that is used as a source of information by the Financial Application. If the Financial Application is used in conjunction with the Personnel/Payroll Application, the payroll data will be processed through the complete financial processes.

If the Financial Application is not used in conjunction with the Personnel/Payroll Application, the Payroll Financial Activity File is still created, audited against the Financial Audit File, if desired, and processed through a phase of the Financial Application producing daily and monthly reference reporting.

The Personnel/Payroll Application also makes use of the Vendor Master File created by the Accounts Payable Application. The file is used to identify the vendor by means of a numeric code, editing and auditing the codes being used and to convert the codes to meaningful names when preparing warrants and reports.

FINANCIAL APPLICATION

The Financial Application is a comprehensive system of computer programs that produces daily and monthly reports of financial transactions by fund and account and provides controls to help prevent the over expenditure of budgets at the fund and account level. All financial reports required at the school and district level are produced by this application.

While this application can be used as a stand-alone system, it is designed to be used as an integral part of the CRIS Business Subsystem. If the Financial Application is used as a stand-alone system, the data entered into the application, and the processing and reporting is usually minimal. When used in conjunction with the Accounts Payable Application, the Stores Inventory Application, and the Personnel/Payroll Application,

the Financial Application receives nearly all of its data from the other applications and provides the maximum benefit obtainable from the use of automated data processing for financial control and reporting.

Data Processed

Before any financial data may be processed, the Control Application must be used to establish the Business System Master File and the Calendar Master File. Next the Financial Application itself is used to create a Financial Activity Table which contains the general ledger accounts, transactions codes and subsidiary account indicators which are to be used when all applications are processed.

To help prevent the over expenditure of budgets, a Financial Audit File may be maintained at district, school or department levels. This file contains dollar amounts by fund and by account for: budgets, encumberances, expenditures, abatements, and balance of dollars which have not been committed or expended. If the Financial Audit File is used, each application in the CEIS Business Subsystem (except the Control Application) updates the information in it.

Even if the Financial Application is not otherwise utilized, it must be used to create the Financial Activity Table which is required by all the other applications except the Control Application. The Financial Application may also be used to create the Financial Audit File without requiring the use of the full application. Thus, at the beginning of each fiscal year it is necessary to review the Financial Activity Table to insure that all general ledger and subsidiary ledger accounts are on file and correct. A new Financial Audit File should also be created with the new budget data for the fiscal year. While it is possible to enter accounting data without dollar amounts, the budget dollars should be entered as soon as they are available.

When used in conjunction with the other applications in the CEIS Business Subsystem, the Financial Application will receive the majority of its data from the Financial Activity Files created by the other applications. A Financial Transaction Input Form is available for submitting budget amounts, general ledger adjustments and for submitting original entries, if the other applications are not used.

Processing

After the Process Control Records are produced each day for all applications, the first phase of the Financial Application is processed to update the Financial Activity Table and the Financial Audit File as necessary. In addition, any other Financial Application transactions received from a district are validated and saved on a Financial Application Activity File.

As each of the other applications is processed, an activity file is created containing all of the valid transactions processed. These files are identical in format to the Financial Activity File and are merged and serve as input to complete the Financial Application.

The processing of the complete Financial Application is controlled by the options chosen by each district. Some of the options available to a district are: to select the ledgers and reports produced, to produce reports showing detailed transactions and/or summary totals, to use State Class or a variety of Expanded State Class Accounts, to allow fund or account charges to exceed budgets, and to print various reports at the department, school, or district levels.

Reports

All Financial Application reports are produced automatically or as optional requested reports.

A Financial Activity Table Listing will be produced at any time, upon request. Included on the listing are all general ledger and subledger accounts, transaction codes and fund codes authorized by a district.

Automatic Reports A Financial Activity Table Reject Report is produced, if applicable, each time Financial Activity Table transactions are processed. Only valid transaction information is used in the continuation of computer processing. Invalid information is rejected and must be correctly submitted for the next regular processing.

A Batch and Error Report is produced, if applicable, each time Financial Audit File Activity is processed. Rejected information must be submitted correctly for the next regular processing.

After all other applications have been processed and their activity files are available, financial processing is continued. A Daily Financial Reference Report is produced in detail each time these files are processed, reporting that day's activity. If the Business Subsystem is processed less frequently, the "daily" report will be produced indicating all of the activity processed since the last report.

A Monthly Reference Report contains all of the activity processed for the month and includes adjustments made during the month, based on the daily processing.

Both reference reports are produced for each fund within a district. The reports contain three sections plus totals for: Appropriation Ledger, Income Ledger, and General Ledger.

Requested Reports In addition to the reference reports, a district may optionally request four different general accounting reports and two balance reports.

The Appropriation Subsidiary Ledger Report reflects all current and year-to-date activity for element codes 1, 2, 3, and 4 (Expense Accounts 0100000 - 1449999). Current activity for the month and prior activity are listed by element code. Appropriation, expenditure, abatement, encumbrance and balance amounts appear under each of the following headings:

- Object or State Class - for each line item
- Total Prime Account this month
- Prior Balance - Prime Account
- Balance through current month

The Fund Recap Report shows the current and fiscal year-to-date status of each fund at the district level. The report data consist of the summarized totals by fund for the following, shown separately by each of the subsystem applications:

- Expenditure amounts for appropriations, encumbrances, abatements, expenditures, and balance.
- General ledger entries for debits, credits, and balance.
- Current activity.

In addition, the Fund Recap Report shows income amounts for estimated income, abatements, income and balance.

The Income Ledger shows the current and year-to-date activity for income accounts. Estimated income, amounts received, abatements, and balance amounts appear under each of the following headings:

- State Class or Object - for each line item
- Total Prime Account this month or Total Function this month

- Balance - prior month
- Balance through current month

The General Ledger show the current and year-to-date activity for the general ledger accounts. Debit and credit amounts appear under each of the following headings for prime accounts:

- Object- for each line item
- Net change this month
- Balance - prior month
- Balance through current month

The Negative Balance Report indicates the expenditure accounts that have negative (credit) dollar amounts. Budget, encumbrance, abatement, expenditure, and negative balance amounts are shown for each fund and account.

The Uncommitted Balance Report shows the current status of each account on the Financial Audit File. The report may be printed on three separate levels: district; district and school; or district, school and department. Budget, encumbrance, abatement, expenditure, and uncommitted balance amounts are shown for each amount within each fund.

Interface With Other Applications

The Financial Application may be used as a stand-alone application, but the Business Subsystem is designed for the automatic feeding of all financial transactions from the other applications into this application. Maximum benefit is obtained when all applications of the CEIS Business Subsystem are utilized together as an integrated system.

As do the other basic applications, the Financial Application depends upon the Control Application for the Business System Master File and the Calendar Master File. Also considered a control file and required by the other basic applications of the subsystem is the Financial Activity Table created by this application.

The Financial Audit File is updated by the other processing applications if it is available.

The other processing applications provide activity files as the major source of data for the Financial Application.

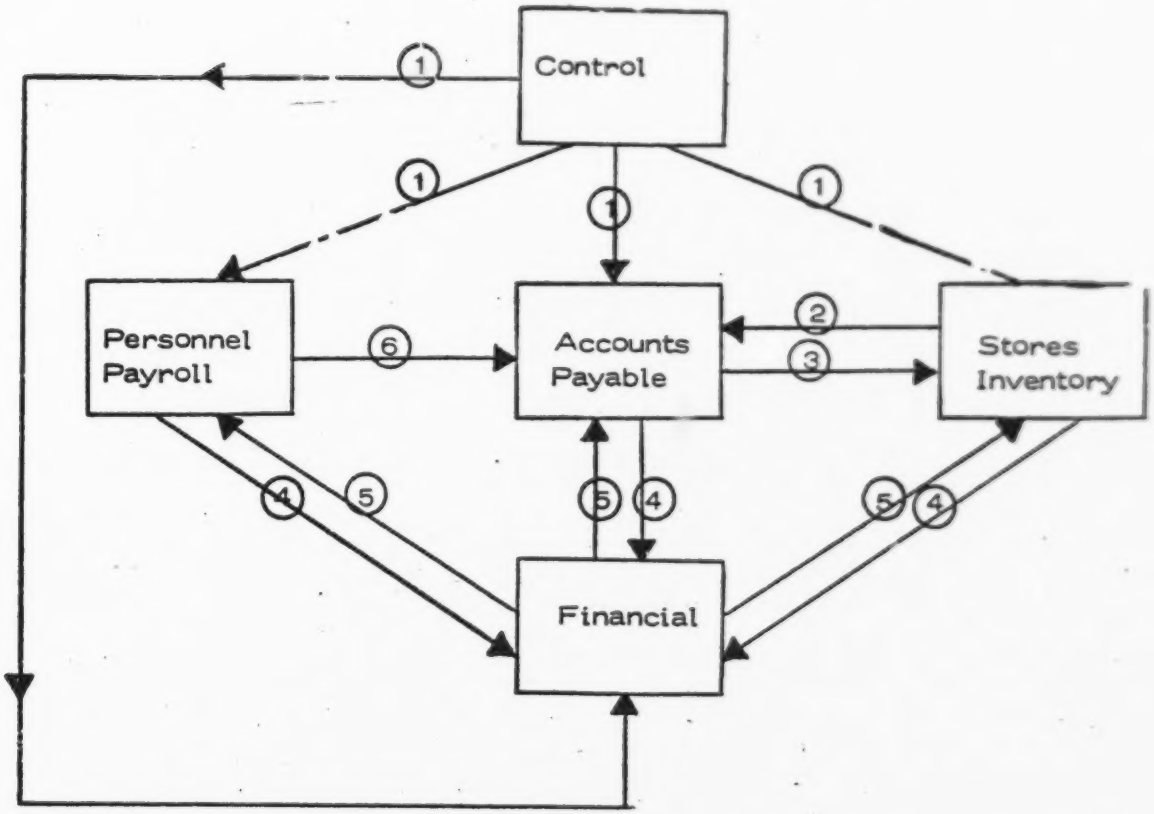
CEIS BUSINESS SUBSYSTEM SUMMARY

The CEIS Business Subsystem consists of four processing applications and a Control Application. A district may use all of the CEIS Business Subsystem applications, or any combination of them. The Control Application must always be used since it schedules and controls the use of each of the other applications in the subsystem.

While the total CEIS Business Subsystem design includes the capability for applications to operate on a stand-alone basis, the most effective results are obtained when all the applications are used together as an intregrated system. Figure 1 shows the relationships and information flow between the applications. Figure 2 summarizes the various reports that are produced by each application.

The CEIS Business Subsystem is designed to be an aid to its users, with district and county administrators maintaining complete control over all district and county business activities.

THE RELATIONSHIP OF OTHER BUSINESS APPLICATIONS TO CONTROL



(1) Process Control Records (Schedules, Options, Control Data) and Business System Master File (Descriptive Information)

(2) Stores Inventory Master File (Inventory Item Conversion Factors, Units of Measure, Stock Numbers)

(3) Accounts Payable Activity for Stores (Items of Inventory; Order, Received, and Pricing Information)

(4) Financial Activity Transactions

(5) Financial Audit File (Budgets, Available Funds) and Financial Activity Table (Table of Proper Financial Entries)

(6) Request for Non-P.O. Payment

CEIS PUPIL SUBSYSTEM

INTRODUCTION

The new CEIS Pupil Subsystem has been developed to furnish schools with a comprehensive means of processing and storing pupil data for use by teachers, counselors, administrators, and educators at all levels, through the utilization of modern electronic computers. The subsystem consists of eight processing applications and a Process Control Application. The eight processing applications and their general functions are:

- Master File Maintenance Application - creates a file of current student information for use by the other processing applications.
- Attendance Accounting Application - reports on students who are absent.
- Mark Reporting Application - records the marks each student receives for courses taken.
- Test Reporting Application - creates test answer media, scores tests, and reports test results.
- California Guidance Application - gathers data from all applications to maintain a student history file and to create a historical record of the student's academic career, including a synopsis of his health data, test scores, and mark-point averages.
- Educational Planning Application - provides diagnostic reports of students who exceed a norm, students who are below a norm, and students whose achievement is apparently not in accord with their abilities.
- Student Scheduling Application - schedules students into classes, using a manufacturer supplied scheduler.
- Master Schedule Builder Application - assists school administrators to develop a master schedule of courses.

A school or district may elect to use less than the full number of applications in the CEIS Pupil Subsystem and gain benefit from the use of those applications selected. Each application, however, is designed as a part of an integrated system and maximum benefit is usually obtained when all of the applications are utilized. Obviously, most elementary schools do not require the Student Scheduling Application or the Master Schedule Builder Application. All of the other applications contribute to the building of reports and statistics that enable school administrators and educational planners to monitor the effectiveness of their programs as well as relieve many school individuals of time-consuming clerical tasks.

PROCESS CONTROL APPLICATION

The key to the new CEIS Pupil Subsystem is the Process Control Application. Two types of information are used by this application:

- Identification data - for whom are data to be processed.
- Processing data - what processing and reports are to be accomplished.

These two types of data must be entered into this application before any other application in the Pupil Subsystem can be processed, for the files created by this application are used by every other application to control the processing options and provide needed identification data.

Data Processed

The Process Control Application creates two files that are required by every application in the subsystem. The Identification File contains the descriptive identification of each school and district using the subsystem. Information contained in the file such as school name and address is used by all other applications in the subsystem to head reports produced by those applications. The information in the file may be added to, changed, or deleted at any time.

The Application Options File stores CRTs which applications are to be processed for each school. The file also identifies the specific reports desired and the sequence of data presentation for each school. These levels of options are used to create the total file. The data center enters the options it intends to offer to its users. Each district enters the options is authorizes for use by its schools. Each school selects from the authorized options those that will provide it with the reports and processing it desires.

Processing

The Process Control Application is processed whenever any additions, changes, or deletions are to be made to either of the two files it maintains. The application can be run as often as is necessary to allow each school to obtain only those reports and report sequences it desires.

Reports

An Activity Report is printed whenever any change in identification or option data is made. The report is divided into two different sections: Identification Activity Report and Option Activity Report. Each of the sections gives a complete picture of all data held in the two application files respectively. Any data that have been changed since the previous running of the application program are flagged for easy identification and review.

The Application Options Listing may be produced for each school at any time, showing which options have been selected, and those which are available but not selected.

Interface With Other Applications

The two files created by the Process Control Application are used by every other application in the CRIS Pupil Subsystem. Thus this application has an interface with each of the other applications in the subsystem.

MASTER FILE MAINTENANCE APPLICATION

The heart of the CRIS Pupil Subsystem is the Student Master file that provides all current information for each student. The data are used, directly or indirectly, by all other applications in the subsystem except the Process Control Application. Each of the applications not only uses data from the file, but may also place the latest data back into the file. Thus, like the Process Control Application, the selection of the Master File Maintenance Application is necessary for all normal utilization of the CRIS Pupil Subsystem.

Data Processed

All data processed by the file maintenance application are contained in the Student Master File. The data includes student identification, parent or guardian information, residency information, emergency contacts, health data, counselor identity, and current class schedule as well as other miscellaneous items of pertinent data about a student. Also included in the Student Master File are test data, mark point average data, and attendance data, but these three types of data are initially created by the applications designed to process these data types specifically. All data on the file may be corrected directly through the Master File Maintenance application.

Processing

The Student Master File is divided into modules of information for each student. If a school chooses not to use all applications, the modules for those applications will not be present. Master File Maintenance application processing enables the establishment and updating of the basic modules of the Student Master File which are used by most of the other applications in the IEIS Pupil Subsystem. Processing speed and efficiency are obtained in the other applications by providing them with a single Student Master File that is maintained by this one Master File Maintenance application.

Reports

Eight different reports are available from the Master File Maintenance application and are produced according to the options a school has entered into the Process Control Application.

The Student Data Transmittal Form shows up to 47 different items of information for each student. The basic data on the form are valuable to the counseling and other offices in a school. Besides presenting information about a student, the form also is used as a "turn-around document" and is sent to the data center with any changes, additions or deletions of student data which are to be made in the Student Master File.

The Health and Guidance Form serves as a reference source for emergency contact information, Special Education data, health codes, and other data of value to various school offices. This form is also a "turn-around document".

A Student Roster may be requested optionally by any Secondary level school. The report shows basic identification data about each student enrolled in the school.

A Student Class List may be requested optionally by an Elementary level school. The list is printed alphabetically within home room number and provides basic identification data about each student enrolled.

Because the Master File Maintenance Application is the first application to be made of new students entering a school, it provides supplemental Attendance Accounting Input Forms for use in recording attendance of new students.

All data from the two "turn-around documents" used in this application are tested for validity during the processing of the application. Ten error reports are produced during the application processing to indicate any data in error or missing. Included on one of the reports are data about each student for whom a deletion is requested.

Interface With Other Applications

The Master File Maintenance application requires access to the two files created by the Process Control application.

The Student Master File created by this application is used directly by the Attendance Accounting Application, the Mark Reporting Application, the Test Scoring Application, the Cafeteria Guidance Application, and the Student Scheduling Application. The Student Master File is used indirectly by the Educational Planning Application and the Master Schedule Builder Application.

Attendance accounting application

The IBIS Attendance Accounting Application provides the audio upon which student attendance may be recorded. The application provides a variety of reports to satisfy the needs of all levels of education. Student attendance data is placed in the Student Master File for use by other applications in the IBIS Pupil Subsystem.

Data Processed

At the beginning of every school year, each school must supply a definition of its school calendar. Included in the definition are holidays, vacations, all known teacher institute days, and the beginning and ending dates of the 10 school months of that month each.

Attendance is recorded on audio supplied by the data center. The recording is made only for students who are not in school. The absences are recorded as ill, Excused, Not Permitted, or Not Excused.

Processing

On the first of each school month, Mark-sense cards or Mark-sense sheets are furnished for all known students in each school. The use of cards or sheets is determined by the equipment available in the data center. If Mark-sense cards are furnished to record attendance, one card is created for each student. If Mark-sense sheets are furnished to record attendance, up to 30 students in a class are listed on each sheet.

When the attendance data is entered in the data center, the cards or sheets are "read" by the data center equipment and the data is entered into the Student Master File. Two cards or sheets are prepared for the next school month and a variety of attendance reports are produced.

Reports

Six different monthly reports are optionally available from the Attendance Accounting Application.

The Regular Attendance Report lists each student by name and other identification, total attendance pattern for the month, as well as monthly and annual attendance data about the student. An average Daily Attendance section at the end of the report shows the following: ADA by each within grade level, number of absences by type of absence within grade level, and the school's current and school year-to-date ADA by grade level with an overall school total.

The Drop and Enrollment Report lists all dropped or newly enrolled students for the month with the students' attendance patterns. Totals at the end of the report include the month and cumulative school year-to-date AIR by grade level and for the entire school.

The Irregular Attendance Report lists only those students whose number of absences are equal to or greater than a number previously specified by the school.

The Districts of Residence Report lists individual student data for Junior High students only whose home district is not their school district.

Successive Absence Warnings are produced for mailing to the parent or guardian of students with too many absences as determined by school selected criteria.

Room Load Reports for Elementary schools list by teacher the number of boys and the number of girls in a class. Totals by grade level are also printed.

All of the above mentioned reports are optional for each school using the Attendance Accounting Application. In addition, three different error reports are printed if errors occur in the attendance data submitted to the data center.

Interfaces With Other Applications

The Attendance Accounting Application requires access to the two files created by the Process Control Application and also uses the Student Master File that is maintained by the Master File Maintenance Application.

Data supplied by the Attendance Accounting Application is used by the Mark Reporting Application and the California Database Application.

MARK REPORTING APPLICATION

The Mark Reporting Application provides a means of capturing student progress data for reports to parents and to concerned school personnel. The data gathered by this application are entered into the Student Master File and are available for use by the other applications in the IBIS Pupil Subsystem. Report Cards and other optional reports are produced by this application when requested.

Data Processed

Student marks, including optional plus and minus signs, are the prime data processed by this application. Up to ten 'school specified' comments may also be indicated for each course for which a student receives a mark. Up to three marking periods are accommodated per semester as well as a final semester grade.

Processing

The processing of the Mark Reporting Application is divided into four phases. The programs of each phase may be used more than once, if necessary, to enable a school to obtain accurate data before beginning the next phase.

Phase 1 permits the construction or correction of a school's Course Master File. Transaction Listings are produced for all data submitted and error messages are indicated if necessary. A Course Directory is printed to show all courses that constitute the completed Course Master File.

Phase 2 prepares the documents upon which student marks are to be recorded. Before the mark collecting documents are prepared, course data for each student are extracted from the Student Master File and are matched against the Course Master File. If any data fails to match, an Unmatched Course Master Report is printed and the preparation of the mark collecting documents is suspended until a match is obtained on student course data and the Course Master File.

Phase 3 accepts the completed mark collecting documents which are either mark-sense cards or mark-sense sheets according to data center facilities. This phase verifies that marks are entered for every course of every student and edits the marks and the comment indicators for validity. Three different error reports may be produced to permit a school to obtain final accuracy.

Phase 4 prepares any or all of the five optional reports produced by the application.

Reports

Report Cards contain a complete report of each student's performance in all courses taken during the marking period or semester. The cards show the percentage mark and absences and are designed so that they may be mailed in window envelopes if desired.

The Subject-Wise Report is printed in alphabetic student sequence within each teacher-period combination. All mark information for each student is shown on the report.

[R] Reports show only students with marks of 'D', 'F', or 'Incomplete'.

Mark Analysis Reports contain computer calculated distributions of current period marks by grades given and percentile with overall mark point averages for each teacher-course combination. If the report is in sequence by course, subtotals are printed for each course and each department. If the report is in sequence by teacher, subtotals are printed for each teacher.

[R] Listings show computer calculated mark point averages, ranks, and percentiles for the current marking period only. The listings are available in four different sequences.

Interfaces With Other Applications

The Mark Reporting application requires access to the new files created by the Process Control application. The Student Master File from the Master File Maintenance application is also required. In addition, the Course Master File from the Student Scheduling application is optional, if available.

Data supplied by the Mark Reporting application are used directly by the Cafeteria Cashless Application and indirectly by the Educational Planning Application.

MARK REPORTING APPLICATION

The Mark Reporting Application facilitates actual reporting for both the student and the test supervisor. The application scores the tests, corrects the raw scores, and produces a variety of optional reports.

Unlike the other applications in the IBIS Pupil Subsystem, the Mark Reporting Application may be used as a stand-alone application with only the Process Control Application required to guide the processing. The Mark Reporting Application is, however,

an integral part of the total capabilities offered through use of the full CRIS Pupil Subsystem.

Data Processing

The Test Reporting Application is able to score any test if the test answers are recorded on IBM test cards or mark-sense sheets. Correct test answers must be supplied in machine-readable form before any scoring can take place.

Each school year identify the group(s) of students that are to be tested so that individual student identity can be taken from the Student Master File. A form is available upon which students may be added to a test group or, if a Student Master File is not available, the form is used to identify each student in a test group.

Unless already available to the data center, data required to convert raw scores must be supplied.

Processing

The Test Reporting Application processes a pre-identified testing packet for each student to be tested. The packets consist of either IBM test cards or mark-sense sheets. The students need only enter marks indicating their answers. They do not fill in their name or any other identification because it is preprinted by the data center.

After the test documents are returned to the data center, they are scored and the individual answers are placed in a holding file. Corrections to the raw score of any student may be accomplished. When all raw scores in the holding file are deemed correct and complete, the raw scores are converted into IQ scores, grade placement scores, etc., according to the particular test requirements.

Reports

All reports from the Test Reporting Application are optional and a school receives only those reports it desires.

A Test Results Roster shows all subtest data for each student tested. Included for each student are age, testing date, subtest numeric names and scores, aptitude and achievement test names, and a total score.

A Permanent Record Label shows student name, grade, age, date of test, testing mode, and all computed scores for a test on a pressure-sensitive label that may be used to update a student's permanent record.

A Student Test Profile report shows individual student subtest scores. Percentile and percentile bands are displayed in a histographic format with a single bar per subtest.

A Single Point Frequency Distribution report lists raw scores numerically from lowest to highest, giving the number of students who achieved each score, the number of students who received that score and below, and the percentile of the group for each grade.

The Multiple Point Frequency Distribution report is similar to the Single Point Frequency Distribution. In addition it reports, by subtest, arithmetic mean, first and third quartile scores, median score, and standard deviation.

The Item Analysis report lists up to seven possible answers to a question and prints the number of pupils who selected each answer.

A Cluster Analysis report shows group response patterns for a given set of related items. Up to 25 items can comprise a cluster and up to 25 clusters can be analyzed in a subtest.

A magnetic tape can be requested to transmit results of state mandated tests to the state.

Interface With Other Applications

If the Test Reporting Application is used as a stand-alone application, only the new files created by the Program Control Application are required.

When used in conjunction with other applications : the CEIS Pupil Subsystem, the files from the Program Control Application and the Student Master File from the File Maintenance Application are required.

Data prepared by the Test Reporting Application are used by the California Guidance Application and the Educational Planning Application.

CALIFORNIA GUIDANCE APPLICATION

The California Guidance Application maintains a Student History File in which pertinent information is taken from the Student Master File and is retained during the total time a student is enrolled in each school. Two newly designed reports, a California Academic Achievement Record and a California Guidance Report, are prepared for each student at the end of every semester for use by counseling personnel.

Data Processed

The Student History File is the repository for all past data about each student's enrollment in his school. Data included in the file are:

- Personal student information.
- Record of all courses taken.
- All semester mark point averages.
- All results of standardized tests.
- Health data.
- Any awards and activities.
- Two college entrance exam results.
- Special education programs.
- Educational program codes used by the schools.

Although requirements are not yet defined for program accountability, educational program codes are retained for each course a student has completed. The availability of historical student data coupled with program codes for each course should prove of great value when program accountability is implemented.

Processing

The California Guidance Application maintains the Student History File with data taken from the Student Master File and school submitted forms. The two reports produced by the application are "turn-around" documents and corrections, additions,

or deletions may be indicated on the forms. In addition, a separate form is used to enter awards or activity data, college entrance examination data, and certain student health data.

The processing of the application generates calculated MPA, current percentile rank, cumulative percentile rank, cumulative credits, mark points, and units attempted for inclusion in the student files. The processing also creates a data file with all needed information for the Educational Planning Application, if a school has chosen that application.

Reports

The new California Guidance Report presents current and cumulative information to serve as an effective guidance instrument for counselors and students. The report includes identifying and personal student information, course credit data, health data, awards and activities, latest and last prior ability and achievement test results, as well as course credits and MPA by department and by semester.

The California Academic Achievement Record provides a complete historical record of each course a student has taken while enrolled in school. The course data includes the course number and title, number of credits, mark received, and date of completion. In addition to the above, the California Academic Achievement Record shows the following student data:

- Credits and MPA by department.
- Latest ability and achievement test percentiles.
- State College MPA and total MPA.
- Rank and number in class.
- Credits, current year, previous, and total.
- Year's absences, excused and not excused.
- Credit deficiency.
- Credits required for graduation.
- College entrance test scores.
- Awards and activities.

In addition to serving the needs of the counselor, the California Academic Achievement Record may serve as an official transcript for each student for both interschool transfers and for college admission.

Interface With Other Applications

The California Guidance Application requires access to the two files created by the Process Control Application. Also used is a Mark Reporting File from the Mark Reporting Application, a Test Reporting File and the Test ID Tables from the Test Reporting Application, and the Student Master File from the Master File Maintenance Application.

The California Guidance Application creates a file of cumulative mark point averages for use by the Master File Maintenance Application and a Cal Guidance File for use by the Educational Planning Application.

EDUCATION PLANNING APPLICATION

The Educational Planning Application provides school and district administrators with reports which may be used to identify the exceptional student. These reports are controlled entirely by school and district supplied parameters which specify

the data to be selected, the comparisons to be made, and the degree of discrepancy between a student's indicated abilities and his or her achievement required to be classed as exceptional. The student's performance may also be compared against values necessary to identify special sub-groups, such as Mentally Gifted Minors or Educationally Handicapped.

Data Processed

Each school or district supplies its values to be used in identifying special sub-groups of students. In addition, up to 30 comparisons may be made between the following types of data:

- Up to 3 ability subtests.
- Up to 4 achievement subtests.
- Up to 5 departmental MPA values.
- Current overall MPA.
- Cumulative overall MPA.
- Cumulative State College MPA.

Processing

Two of the reports available require the comparison of unlike data such as MPA and test results. Comparison of these data are accomplished by converting all data to a scaled-stanine prior to the actual comparison. The comparisons accomplished are of three types:

- Between any data item and a constant value.
- Between any two data items.
- Between any data item and a second data item which is modified by the addition, subtraction, or multiplication of a constant.

Reports

A Control Listing is produced each time the application is processed. The listing shows the comparative analysis parameters, the achievement deficiency parameters, and the honor roll parameters used by this processing of the application.

Three different Comparative Analysis Reports may be requested. The Comparative Analysis, Detail By Student is produced for use by the counselors. It lists those students who met the conditions of one or more of up to 30 school specified comparisons. A maximum of four comments are printed for each student, comments that the school has chosen to report on each comparison.

The Comparative Analysis, Summary By School is produced for use by school administration. This report is a summary comparative analysis showing number and percentage of students by grade level with the comment for each comparison.

The Comparative Analysis, Summary by District is produced for use by district administration. This report is a composite of the reports for each school in the district.

Three Achievement Deficiency Reports may be requested, a detail report for counselor use and summary reports for school and district administration. The detail report identifies those students who meet any or all of the following criteria:

- Cumulative MPA is less than verbal ability score by a district supplied value.
- Cumulative MPA is less than a district/school supplied constant.
- Cumulative MPA is greater than current MPA by a factor supplied by the district/school.
- Cumulative credits earned are less than the credits required at the student's current grade level.

A Student Honor List may be requested which shows those students whose MPA is equal to or greater than a value specified by the district or school and who have completed a minimum number of credits also specified by the district or school.

A Department Honor List may be requested which shows those students whose departmental MPA is equal to or greater than a value specified by the district or school and who have completed a minimum number of courses in that department as specified by the district or school.

Interface With Other Applications

The Educational Planning Application requires access to the two files created by the Process Control Application. The Cal Guidance File created by the California Guidance Application is the sole source of data to be processed.

STUDENT SCHEDULING APPLICATION

The Student Scheduling Application offers each school a flexible and comprehensive means of building a master course schedule that satisfies student needs and then assigns students to classes within the final course schedule. Two alternatives are available for the preparation of the master course schedule. A school may use the Conflict Matrix and Course Tallies Reports from this application to build the master course schedule manually, or a school may use the new Master Schedule Builder Application. This application provides an interface to CEIS for a manufacturer supplied scheduler.

Data Processed

The data processed by the Student Scheduling Application comes from three sources. A school must submit its intended course catalog before any processing can be started. An abbreviated Student Master File is furnished by the Master File Maintenance Application. Students enter the courses they are requesting on Student Course Request documents which contain student identification preprinted by this application.

Processing

The Student Scheduling Application consists of a series of computer programs that are used in four different phases. Programs of each phase may be used more than once to enable a school to obtain accurate and optimum results before the next phase is begun.

Phase 1 prepares the Student Course Request documents, one for each student in the abbreviated Student Master File. These documents are either Mark-sense sheets or gummed labels with student identification that are affixed to separate sheets. All courses offered are listed on each form a student receives.

Phase 2 accepts Course Change cards to update the intended course catalog as well as the Student Course Request data. Separate reports list all data entered and any error conditions are indicated on the reports. Also produced are the Course Tallies Report and the Conflict Matrix Report. The school may use these reports to develop their own course master schedule or to prepare data for the Master Schedule Builder Application.

Phase 3 accepts the Master Schedule as built by the school or by the Master Schedule Builder Application. The manufacturer's supplied scheduling program then assigns students to their requested courses. If too many students have internal conflicts, a new Master Schedule may be submitted and the scheduling program rerun. Even with the best Master Schedule, there will be students with unresolved conflicts. These students, along with their counselors, will have to manually rearrange their schedules to meet the final Master Schedule conditions.

Phase 4 requires added information for all courses in the final Master Schedule. Also entered into phase 4 are changes to student assignments and manually scheduled student assignments. Final reports are printed and each student's course assignments are entered into the Student Master File.

Reports

Phase 1 produces the Student Course Request documents described earlier. The phase also produces a Course Index Cross Reference report of one page to be used as a reference in preparing the remaining data entry forms used by the application.

Phase 2 produces the Student Request List which shows all courses requested by student with any error messages associated with the student identification and/or student course requests. Missing Student Course Request forms are indicated.

The Conflict Matrix report shows the number of student request conflicts that will result if any two recorded courses are offered at the same time. This report, in conjunction with the Course Tallies Report, is used to produce the Master Schedule.

The course Tallies Report lists for each course the total number of student requests, total requests by sex of student, and total requests by grade level by sex of student.

Phase 3 produces a Course Master Error List and a Course Master Update Error report to indicate any errors in the Master Schedule.

Phase 4 produces two different error reports, if applicable. The Schedule List shows the computer assigned sequence number for each section of each course.

The Student Master Update Exception report results from the matching of students recorded on the assignment file with those on the Student Master File. Invalid or missing students from either file are identified along with an error message.

Locator Cards are printed only after all scheduling is completed for a school. Printed on each card set of two identical parts are all pertinent student identification, the student's course schedule for the upcoming semester or school year and additional parental information.

The Class List report is printed after the Locator Cards with one page for each course section containing an alphabetical listing of all students assigned to the specific class.

Interface With Other Applications

The Student Scheduling Application requires access to the two files created by the Process Control Application. The Abbreviated Student Master File and the regular Student Master File from the File Maintenance Application are utilized.

Although the Master Schedule Builder Application uses data from and prepares data for the Student Scheduling Application, all data must be manually transcribed and the interface between the two applications is therefore indirect.

MASTER SCHEDULE BUILDER APPLICATION

The Master Schedule Builder Application is designed to use the course request data from the Student Scheduling Application, combined with a minimal amount of data about proposed course offerings, to produce a Master Schedule that minimizes the number of student conflicts. Normally a school requires one or two scheduling simulation runs before an acceptable master schedule can be developed. The Master Schedule Builder Application can accomplish the same result in much less time.

Data Processed

In addition to course request data from the Student Scheduling Application, the Master Schedule Builder Application must be supplied with data recorded on three different forms. The Period Designation Form records the number of periods available to the school. The Course Master/Teacher Control Form identifies a course to be offered and the identification numbers of up to 16 teachers who are qualified and available to instruct the course. The form provides for periods that a course must be offered and for periods that a course cannot be offered. The maximum number of seats per section of the course is also specified. The third form is the Teacher Assignment Form which indicates by teacher, the maximum number of periods the teacher is available for course instruction, specific periods that the teacher must instruct, and any specific periods that the teacher cannot instruct.

Processing

Processing begins by tallying the student requests by course and determining the required number of sections for each course. For those courses which require only one section, a conflict matrix is produced from the student requests. This matrix is used to schedule those single section courses throughout the day in such a manner as to minimize potential conflicts. Courses with multiple sections are then scheduled in a manner designed to achieve a uniform period load. Each course section is then assigned a teacher from the teacher availability information associated with the course. An effort is made to distribute teacher loads and no teacher is assigned to teach more classes than are specified on his Teacher Assignment Form. This processing produces input for the manufacturer's supplied scheduling programs used by the Student Scheduling Application.

Reports

The Course With No Teachers Report lists any course sections without a teacher assigned.

The Teacher Load Report lists course and period information for every course assigned to each teacher as well as the number of periods that the teacher has remaining available for assignment.

A Course Seating report shows the maximum available seats and the number that have been requested for each course.

The major report from the application is the Master Schedule Listing. This report can be used as a preliminary or final course schedule. Using this report, a school can prepare the course master data required by the Student Scheduling Application and subsequently reduce the number of scheduling alterations now required to achieve an acceptable and complete course schedule. The Master Schedule Listing shows course description, course code, section number, period offered, semester, maximum number of seats available, teacher name, teacher number, and grade level of each course.

Interface With Other Applications

The Master Schedule Builder Application requires access to the two files created by the Process Control Application.

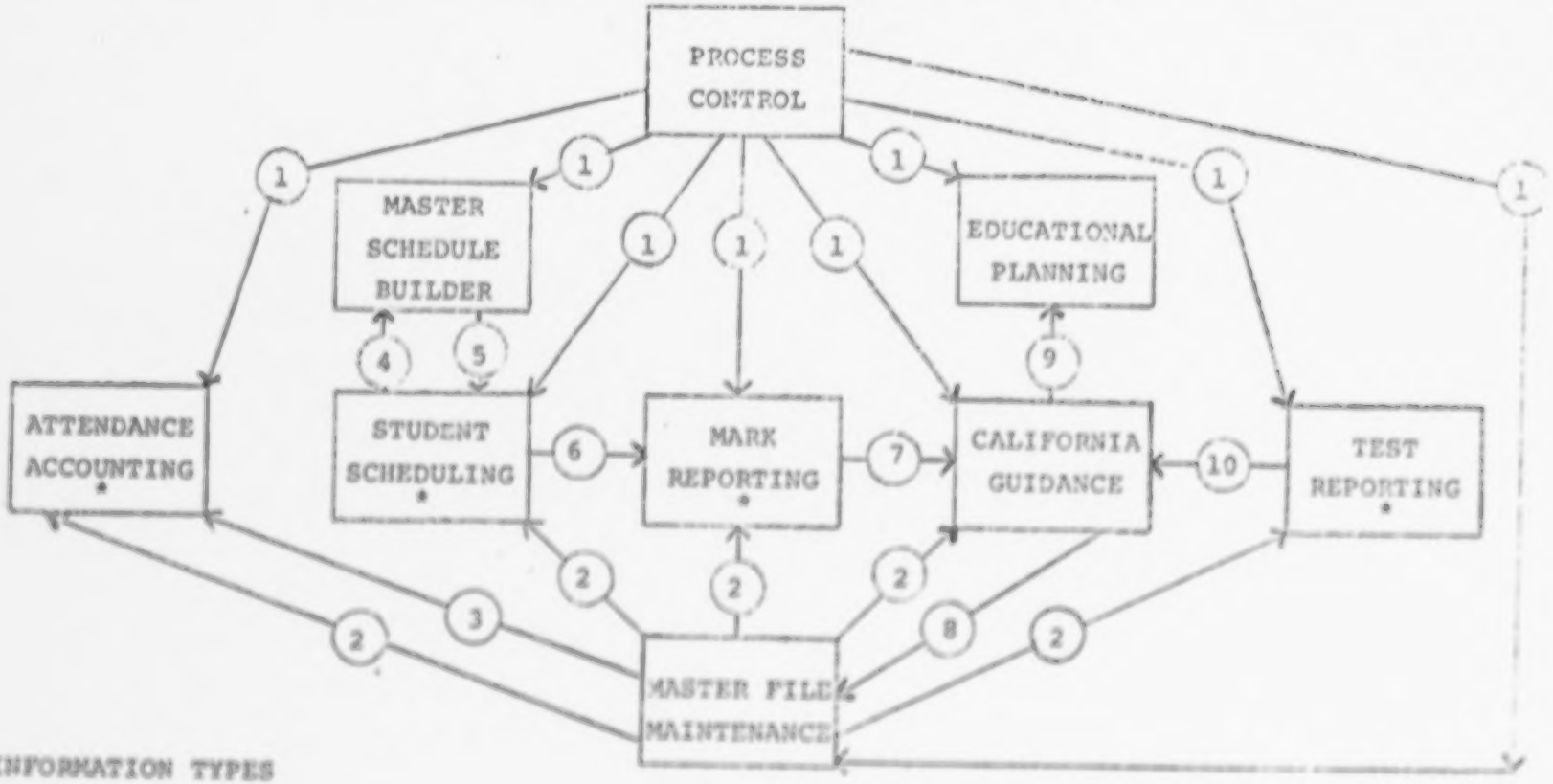
Although the Master Schedule Builder Application uses data from and prepares data for the Student Scheduling Application, all data must be manually transcribed and the interface between the two applications is therefore indirect.

(BIS Pupil Accounting System)

The applications of the (BIS Pupil Subsystem process information for the student. In addition to processing information for the student, the applications compile current and historical data for each student for the purpose of improving his educational experience. Teachers, counselors, administrators and educators at all levels are furnished with pertinent information to monitor the effectiveness of their educational programs.

The nine applications in the (BIS Pupil Subsystem are designed to operate as an integrated system. Although some benefit may be obtained from the use of only portions of the subsystem, maximum benefit is possible through use of the entire subsystem. When combined with the (BIS Business Subsystem, the (BIS Pupil Subsystem provides schools and districts with the most complete information concerning capabilities available today. The two subsystems are designed such that future requirements for educational information processing may be incorporated with minimal effort. (BIS is a system for use by many to address that is designed with the flexibility to accommodate most, if not all, of tomorrow's needs.

THE RELATIONSHIP OF OTHER PUPIL APPLICATIONS TO CONTROL



INFORMATION TYPES

1 Control Data
2 Student Master File
3 Forms For Late Enrollments
4 Course Request Data
5 Master Course Schedule
6 Master Course Schedule
7 Semester Marks
8 MPA File
9 Test Results and MPA
10 Test Results and Test ID Table

* All add their own data directly into the Student Master File